

REMARKS

Claims 19 – 42 are pending in the application. Claims 19 and 37 – 39 are independent claims.

In the present response, the claims are not amended.

The Office Action objects to the drawings because the drawing must show every feature of the invention specified in the claims. In the attached Replacement Drawing Sheet, Fig. 7 now shows the reflective outcoupling material having an angular width that varies along a length of the rod, distributed in a series of stripes perpendicular to the length of the rod. The support for the amendment to the drawings may be found in Applicants' specification, page 6, lines 10 – 14. No new matter is added. Applicants respectfully request that the objection to the drawings be withdrawn.

35 U.S.C. 102

The Office action rejects claims 19 – 30 under 35 U.S.C. 102(b) over Masutani et al. (U.S. Patent 6,488,397, hereinafter Masutani).

Applicants submit that for at least the following reasons, claims 19 – 30 are patentable over Masutani.

For example, claim 19 requires:

"an angular width of the reflective outcoupling material affixed to the outer surface of the rod controls an angular distribution of light leaving the side of the rod."

The Office action, page 4, it is alleged that Masutani, column 2, lines 16 - 22, discloses the above claimed features. However, Applicants respectfully disagree.

Masutani, column 2, lines 16 – 22, recites:

"The linear illuminant system of this invention has the strip-shaped reflecting layer formed along the length of the light transmission cylinder to reflect light passing through the light transmission cylinder. Reflected light

forms linear light with **high directivity** and luminance to emerge from the side surface area opposite to the reflecting layer. Consequently, strong side luminance with sufficient brightness is obtained." [Emphasis added]

Applicants submit that nothing in the cited passage teaches or suggest that that the angular distribution of light leaving the side of the rod can be controlled by the angular width of the reflective outcoupling material. Clearly, from the above cited text, Masutani discloses that the reflected light forms linear light with **high directivity**. Applicants submit that the highly directive light must be a very narrow angular distribution of light. Yet, having a wide angular distribution of light would clearly defeat the **high directivity** feature in Masutani. This clearly shows that the teaching of Masutani does not intend that the angular distribution of light can be adjusted because it is undesirable for the system of Masutani to have angular distribution of light that is not highly directional. Therefore, Masutani fails to teach the claimed feature: an angular width of the reflective outcoupling material affixed to the outer surface of the rod controls an angular distribution of light leaving the side of the rod.

In view of at least the foregoing, Applicants submit that claim 1 is patentable over Masutani. Claims 20 – 30 are also patentable because they at least depend from claim 1, with each claim containing further distinguishing features. Withdrawal of the rejection of claims 19 – 30 under 35 U.S.C. 102(b) is respectfully requested.

35 U.S.C. 103

Under 35 U.S.C. 103(a) the Office Action rejects claim 31 – 33 over Masutani in view of Hassler, Jr. (U.S. Patent 4,954,931); claim 34 over Masutani in view of Ashall (U.S. Patent 5,390,436); claims 35 and 36 over Masutani in view of Reid et al. (U.S. Patent 6,267,492, hereinafter Reid); claims 37 and 38 over Masutani in view of Hassler, Jr.; and claims 39 – 42 over Masutani in view of Yokoyama (U.S. Patent 5,134,549).

Applicant respectfully submits that claims 19 – 42 contain features that are not found in any of the cited references.

For example, claim 37 requires:

"controlling a width of the reflective outcoupling material to achieve a desired angular distribution of light leaving the side of the rod."

Similarly, claim 38 requires:

"wherein the reflective outcoupling material exclusively controls an angular distribution of light leaving a side of the rod."

In addition, claim 39 also requires:

"wherein the reflective outcoupling material exclusively controls an angular distribution of light leaving a side of the rod."

Applicants essentially repeat the above arguments for claim 19 and apply them to claims 37 – 39 pointing out why Masutani fails to disclose the above claimed features. Applicants further submit that Hassler, Jr., Ashall, Reid, and Yokoyama, alone or in combination, fail to bridge the feature gap between Masutani and claim 19 as discussed above because the claimed features are not taught or inherent in any of the cited references. For example, Ashall shows paint dots that transmit light rather than reflect light, and there is no discussion on the angular distribution of light controlled by the angular width of the reflective outcoupling material. Similarly, Yokoyama shows merely transmissive outcoupling material which operates by diffusion, but does not disclose that the angular distribution of light controlled by the angular width of the reflective outcoupling material. Therefore, claims 19 and 37 – 39 are patentable over Masutani, Hassler, Jr., Ashall, Reid, and Yokoyama, either singly or in combination.

Claims 31 – 36 and 40 – 42 are patentable for at least the reason that they respectively depend from claims 19 and 39, with each claim containing further distinguishing features.

For example, claims 31 – 33 further require different cross-sectional shapes for the rod. None of the cited references teach or suggest these different shapes. Furthermore, Applicants submit that these shapes are critical to some

aspect of the present system, and are not merely design choices. This is because, according to the laws of refraction, when light leaves the surface of the rod, the angle of light leaving the surface depends on the angle of incident, which depends on the shape of the rod. As disclosed in Applicants' specification, page 5, line 18 through page 6, line 1, the angular distribution of light can depend on the cross-sectional shape of the rod. Therefore, the cross-sectional shape of the rod is a critical feature where a desired angular distribution of light is required in some embodiments of the present invention.

In addition, Applicants' claims 32 recites:

"the angular width of the reflective outcoupling material varies along a length of the rod to provide substantially uniform light distribution."

In the Office Action, page 7, it is conceded by the Office that Masutani does not disclose that the outcoupling material being distributed along an angular width in such a way as to ensure uniform light distribution along the length of the rod. Because of this deficiency in Masutani, the Office cited Hassler, Jr., which discloses a prism with a window on the surface of the prism and the window has a shape which tapers toward the light emitting diodes.

Applicants submit that Hassler, Jr. teaches a tapered shape window on a flat planar front surface of a prism, and that Masutani teaches a reflective layer on the back of a curved surface. Since the geometry and topology of a flat surface are different from that of a curved surface, it is not apparent that a shape on a flat surface would look the same on a curved surface. For example, a rectangle on a flat surface can look like a pincushion on a curved surface. Hence, there is no obvious match or correspondence between one shape on a flat surface and another shape on a curved surface.

Furthermore, the light outcoupling in Hassler, Jr. is by way of diffusion, i.e. the light is scattered at the front frosted surface, yet in Masutani, the light is reflected at the back surface and then refracted at the front surface. Because of the diffusion mechanism, light scatters out in a wide range of angular distribution,

but in reflection and refraction, light travels in a determined direction according to the laws of reflection and refraction. There is no reasonable expectation or suggestion that the light scattered at the front would have similar distribution as that reflected at the back and refracted at the front. Thus, a tapered window on a flat surface, which transmits uniform light along the length, does not suggest that a similar uniform light distribution will result from a varying angular width reflective layer on a curved surface. Therefore, Applicants submit that the combined teachings of Masutani and Hassler, Jr. would not have suggested to those of ordinary skill in the art the claimed feature. This is because with the big differences in geometry, topology, and outcoupling means between Masutani and Hassler, Jr., the tapered window on a flat planar front surface of a prism would not suggest or motivate a person ordinarily skilled in the art to adjust the angular width of the reflective layer on the back curved surface of the rod in order to get uniform light distribution along the length of the rod.

For at least the above further reasons, Applicants submit that claim 32 is patentable because the claimed features "the angular width of the reflective outcoupling material varies along a length of the rod to provide substantially uniform light distribution" is not taught by Masutani and Hassler, Jr., either singly or in combination.

In addition, independent claims 37 – 39 include several similar distinguishing features as discussed above with respect to claim 32. Applicant essentially repeats the above arguments for claim 19 and applies them to claims 37 – 39 pointing out why claims 37 – 39 are patentable over Masutani and Hassler, Jr., alone or in combination.

Withdrawal of the rejection of claims 31 – 42 under 35 U.S.C. 103(a) is respectfully requested.

Conclusion

In view of the foregoing, Applicants respectfully request that the Examiner withdraw the objection(s) and/or rejection(s) of record, allow all the pending claims, and find the application in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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